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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,177	04/29/2005	Rostyslav Ilyushenko	2733.29US01	7171
24113 7590 03/21/2008 PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100				
EXAMINER				
ABOAGYE, MICHAEL				
ART UNIT		PAPER NUMBER		
1793				
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03/21/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/533,177

Applicant(s)

ILYUSHENKO ET AL.

Examiner

MICHAEL ABOAGYE

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 10, 12, 13, 15, 16 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 10, 12, 13, 15, 16 and 22-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9, 10, 12,13,15,16 and 22-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al. (US Patent No. 6,398,883) in view of Thomas et al. (WO 93/10935).

Forrest et al. discloses a method of welding together two metal work-pieces, the method including the following steps: providing two metal work-pieces machined from a block of an aluminum alloy to correspond to pre-selected shape and thickness (Forrest et al., column 3, lines 14-20 and lines 40-47); preparing a portion of at least one work-piece (51, figures 14B and 15), the preparation including friction stir welding process extending only part way into the work-piece from the exterior of (see, partial-penetration mixed regions designated "16" in the figures 1-2D, column 7, lines 15-17) resulting in grain structure refinement of the region extending from the exterior surface into the work-piece to a depth of about 6.5 mm (at least 10mm) and having grain structure finer than the grain structure of the work-piece outside that region (Forrest et al., column 3, lines 15-26, and abstract). After the preparing step, securing a second two work-piece (

an insert 51b) and joining the 2 by fusion welding (Forrest et al., column 5, lines 41-47, figure 16, column 11, lines 30-56); wherein said region extends into the work-piece to a depth that exceeds the depth of material that is caused to melt during the fusion welding process; wherein the welded component is used as an air craft component (Forrest et al., column 5, lines 45-47). Forrest et al. discloses also in figure 1, two structural members designated "11" having planar geometrical configuration and substantially flat surfaces. Forrest et al. includes a friction stir device with a probe or pin which travels through the structural work piece at a speed of about 127 mm – 720 mm per minute (5-30 inches per minute) depending on the thickness of the work pieces, said probe is capable of joining two structural work-pieces having joint depth greater than 50 mm (Forrest et al., abstract, figures 1, 2(A-D), 3(A-B), 16; column 1, line 10 – column 3, line 56 and column 5 line 30 – column 8, line 5 – 15). Forrest et al. teaches work-pieces composed of wrought metal which are cold worked (Forrest et al., column 3, lines 14-15). Forrest et al. teaches work-pieces machined from a block of metal and when welded together form at least part of a structural member suitable for manufacturing an aircraft component, wherein the aircraft component (Forrest et al., abstract, column 3, lines 45-47, column 11, lines 9-15; figures 1 and 16). Forrest et al. teaches components made of aluminum or aluminum alloys (Forrest et al., column 2, lines 5-11)

Forrest et al. fails to teach friction stir welding a region of the both components also prior to joining the insert to the first work pieces.

Thomas et al. teaches a method of welding work-pieces, the method involving using a friction stir tool to plasticized the abutting surface and either in combination or

independently heating the workpiece or the tool by resistance heating means, with the advantage of having a defect free weld and also forming a relatively deep penetrated weld in one pass (Thomas, page 4, lines 10-34). Note the examiner interprets said independent application of resistance heating as either concurrently or after the plasticizing step. It is to be noted that said resistance heating necessarily allows the plasticized region to fuse and thereby aiding the bonding process.

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the invention of Forester to use a hybrid bonding process utilizing friction stir and resistance heating as taught by Thomas et al. in order to produce a defect free weld and also to form a relatively deep penetration weld in one pass (Thomas, page 4, lines 10-34).

3. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al. (US Patent No. 6,398,883) in view of Thomas et al. (WO 93/10935) as applied to claim 23 above and further in view of Bronson et al. (US Patent No. 5,720,824).

Forrest et al. and Thomas teach resistance heating to fuse the plasticized region but fail to teach fusion process performed by means of electron beam.

However Bronson et al. teaches a method of welding a first member and a second member to form an aircraft component; wherein welding process is that of electron beam welding process; wherein said electron beam welding process is adapted due to its easy penetration, narrow width of heat affected zone and consequent

reduction in the propensity to distortion or deformation of the welded work-pieces (Bronson et al., column 1, lines 20-36).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the combined invention of Forrest et al. and Thomas et al. to use electron beam welding as taught by Bronson et al., which is an obvious variant of fusion welding process. Furthermore electron beam welding can easily achieve better penetration into the workpiece(s) while creating narrow width of heat affected zone and thereby reducing the propensity to distortion or deformation of the welded workpiece(s) (Bronson et al., column 1, lines 20-36).

Response to Arguments

4. Applicant's arguments with respect to claims 9, 10, 12,13,15,16 and 22-31 have been considered but are moot in view of the new ground(s) of rejection.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Aboagye/
Assistant Examiner,
Art Unit 1793

/Kevin P. Kerns/

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